



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
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Coastal Protection and Restoration Division
c/o EPA Region X (ECL-117)
1200 Sixth Avenue
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2020 SW 4th Ave., Suite 400
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Dear Kevin:

This letter provides **NOAA's comments on the following documents for the McCormick & Baxter Superfund Site, Willamette River, Portland, Oregon: 1) The *Draft Operation and Maintenance Plan (OMP)*, dated July 26, 2006, and 2) the *Draft Second Five-Year Review Report*, dated September 2006.** NOAA appreciates the opportunity to review these documents and commends the Oregon Department of Environmental Quality for its attention to detail and presentation in compiling these reports. Comments are presented as follows: general comments; specific recommended changes to the draft O&M plan; specific recommended changes to the draft Five-Year plan, and suggested editorial changes to the O&M plan.

General Comments

Ensuring Accuracy and Clarity – NOAA stresses that it is exceedingly important that these documents emphasize accuracy and clarity so that a future project team can rely on this record to give them a complete and accurate assessment of the site. Thus, while some of these comments may seem to be merely editorial, we have tried to explain, where appropriate, how they can change the meaning of the statement. In addition, there are a few items that we believe should be included in each document to improve their utility. These items include:

- A map showing the locations and identifiers for the groundwater wells used to monitor groundwater gradients and NAPL presence;
- A better description of controls, monitoring, and maintenance for the riparian 'buffer', which includes the sheetpile portion of the barrier wall;
- A statement that soils and sediments beneath the engineered caps are still contaminated with creosote NAPL and metals to support the need for ongoing maintenance and institutional controls;
- A more definitive statement regarding performance standards for the groundwater remedy; and



- More discussion of the remaining NAPL outside the barrier wall, particularly between the barrier wall and Willamette Cove, where DNAPL is still being removed from monitoring wells.

Prioritizing Monitoring Activities to Manage Costs – DEQ and EPA site managers indicated in the August 7, 2006 progress meeting that the estimated costs for the planned operations and maintenance are greater than expected and solicited input from project partners on monitoring priorities. NOAA recommends assigning a lower priority to the biological monitoring because aquatic exposures are related not only to this site, but also to the greater Portland Harbor site. In addition, it is reasonable to reduce the measuring and recovery of NAPL from wells within the barrier wall from weekly to monthly. Currently, NAPL accumulates slowly in these wells, generally taking 3-4 weeks before sufficient NAPL accumulates for pumping (See Table 1 in both the June and July, 2006, Technical Memoranda). This is predominantly LNAPL which cannot migrate to the river because of the subsurface barrier wall. *NOAA does not recommend reducing surveying for sediment cap integrity to less often than annually* because the alterations in river bathymetry created by the sediment cap are relatively recent. In addition, the current surveys do not include a permanent record of the condition and elevation of substrate in shallow water and vegetation in the riparian zone. Some type of annual photographic survey would be very helpful for evaluation of whether these habitat components of the site remedy are durable and successful.

Recommended changes to the Draft O&M Plan

Pg. 3, Sec. 4.A. Soil Operable Unit Remedy, 2nd paragraph: *“Soil excavation activities were performed from February through May 1999 and effectively eliminated the presence of contaminated soils above removal action levels in the surficial 4 ft of soil. In several major source areas excavation proceeded to depths of 8 to 10 feet.”* Please add the clarification that the purpose was to remove contamination in the top 4 ft of soil, where direct contact with workers was most likely. It would be helpful to state in this section, that large volumes of deeper soil still contain NAPL creosote, which would support the extension of the O&F period “to accommodate the complex nature of the sediment remedy, particularly in preventing NAPL migration to the river” (pg. 11, last paragraph).

Pg. 4, Sec. 4.A. Soil Operable Unit Remedy, 3rd paragraph: *A Resource Conservation and Recovery Act (RCRA) type impermeable cap was constructed over ~~the entire~~ 14.7-acres ~~area inside of the barrier wall, which excludes 3.1 acres of the riparian area bordering the river.~~ Capping of the 6 acre riparian area ~~had been~~ was completed in 2004 during construction of the sediment cap ~~construction~~. The differences and acreage of the sediment cap, the riparian area, the impermeable cap, and the soil cap, can be confusing to someone not familiar with the site history. We recommend rewriting the statement as indicated to improve its clarity. A delineation of the riparian area on one of the figures would also be helpful.*

Pg.6, Sec. 4.B. Sediment Operable Unit Remedy, 3rd complete paragraph, line 1:

Within the cap footprint were areas of known NAPL ~~migration~~ release (e.g., seep areas). The seep locations are where (mobile) NAPL is released into the river. There are other locations where the NAPL seems to be mobile, but is not released, for example at MW20i.

Pg.7, Sec. 4.B. Sediment Operable Unit Remedy, 5th complete paragraph: This paragraph describes the composition of the soil cap and vegetation in the 6 acre riparian zone, and notes the agreement with National Marine Fisheries Service. It is our impression that there also is an agreement with the City of Portland regarding their Greenway Ordinance that influenced the design of this area. If the City ordinance has any jurisdiction regarding future alterations to the riparian area, it should also be noted. Is this area included in the permanent easement given to the Oregon Division of State Lands?

Pg. 9, Sec. 4.C. Groundwater Operable Unit Remedy, Subsurface Barrier Wall, 1st paragraph: One of the RAO's in the ROD was *"to prevent groundwater discharge to the river that would result in (dissolved) contaminant concentrations in excess of background, or water quality criteria for the protection of aquatic organisms"* (pg.4 of ESD, August 2002). The fully encompassing, impermeable subsurface barrier wall was designed and installed to meet this RAO, also. That is, NAPL control was not the only consideration.

Pg. 10, Sec. 4.C. Groundwater Operable Unit Remedy, Subsurface Barrier Wall, last paragraph: *Although the barrier wall segment located downgradient of the FWDA does not key into a continuous, competent aquitard, this segment of the wall was extended to such a depth that DNAPL migration ~~toward~~ the river will be substantially retarded because of the increased length of the flowpath.* We suggest that an explanation of the reasoning is needed here. DNAPL migration rates may actually increase because of the changed hydraulics under the wall and through the hole, but future releases to the river will be reduced, or eliminated, because more of the NAPL will be captured in the pore-spaces of the longer migration pathway.

Pg. 10, Sec. 4.C. Groundwater Operable Unit Remedy, Subsurface Barrier Wall, bullet 1: *Groundwater flow ~~appears to be~~ is substantially retarded across the barrier wall-river boundary.* The rate of groundwater discharge from the site into the river was substantially reduced by the subsurface barrier wall, and then reduced even more by the addition of the impermeable cap. Monthly groundwater gauging after barrier wall completion indicated that groundwater mounded on the far side of the barrier wall and then migrated around the enclosed source areas before discharging to the river. Before construction of the barrier wall, this volume of groundwater migrated across the site, through contaminated subsurface soils, and then discharged to the river.

Pg. 14, Sec. 7A, Summary of Remedial Action Objectives and O&M Performance Standards:

- *Maintain the armoring layer to within 50 percent of the design specification:
6" Rock Armoring – maintain thickness of at least 6 inches
12" Rock Armoring – maintain thickness of at least 7.5 inches*

24" Rock Armoring – maintain thickness of at least 12 inches

How do you maintain 12 inch rock armoring to a thickness of “at least” 7.5 inches or 24 inch rock armoring to a thickness of 12 inches? It is our recollection that the standards were for a minimum thickness at every location, not an average over some area. Please clarify.

Pg. 15, Description and Frequency of Sediment Cap O&M Activities through

September 30, 2011: As discussed in the site meeting of August 7, 2006, this does not include a mechanism for recording the status of the nearshore area that is too shallow for the side-scan and multi-beam bathymetric surveys. The shallow water areas are important habitat for juvenile salmon and other aquatic resources, as indicated by the NMFS Biological Opinion. It was suggested that annual aerial photographs during low river conditions would be useful in this regard.

Pg. 17, Sec. 8A, Groundwater, Summary of Remedial Act Objectives and Performance Standards, last bullet:

Maintain contaminant concentrations in the Willamette River below baseline concentrations ~~or in excess (?) of the Sediment Cap performance standards for surface water.~~ There can only be one standard, and Oregon state regulation, apparently, requires “baseline”. Something should be said about how to determine these concentrations, or a table of concentrations provided.

Pg. 17, Sec. 8B, Description and Frequency of Groundwater O&M Activities

through September 30, 2011: A figure is needed showing the locations of the monitoring and extraction wells used for the site. It should be noted that some of the wells are outside the perimeter fence and locked gate, and others are on adjacent property. Some of these ‘unprotected’ wells still produce NAPL.

Pg. 22, Number 19, Institutional Controls: This list does not say anything about ensuring the continued integrity of the vegetated soil cap in the riparian zone. Since this area is not consistent with either the sediment remedy (it doesn’t have an armored cap), or the soil remedy (it has different design requirements than the soil cap and is not protected by the fencing), it would be helpful to add a bullet here describing protections for this area.

Pg. 22, Number 19, Institutional Controls, bullet 2: ~~Controls~~ Prohibitions *on future uses of the property that are inconsistent with the level of protectiveness achieved by the cleanup.* This is a clearer statement of the intent, and should be an accurate description of the institutional controls.

Recommended changes to the Draft Second 5-Year Report

Pg. 4, Site History, last sentence: *Remedial investigations identified two large NAPL plumes migrating to the river and impacting surface water and sediments.* Please add: Subsequent monitoring identified another NAPL plume migrating under the BNSF railroad right of way toward Willamette Cove.

Pg. 9, Groundwater Remedy, last bullet: *Maintain contaminant concentrations in the Willamette River below background concentrations or ~~in excess~~ less than of the Sediment Cap performance standards for surface water.* How can the cap design criteria be a compliance standard for contaminant concentrations in the river? It is NOAA's understanding that the compliance criteria were either baseline or AWQC, to comply with Oregon ARARs, which have the advantage that they automatically update to agree with the provisions of the Portland Harbor ROD or changes in Oregon regulations. How will future reviewers decide which concentrations to use? How can there be a choice of compliance measures?

Pg. 15, Subsurface Barrier Wall: Somewhere this should indicate the elevation of the top of the wall because this is pertinent for any future construction, and to estimate the probability that the river or groundwater will overtop the wall. It also should be noted that while OHW (ordinary high water) elevation is approximately equal to the top of the barrier wall, OHW is a jurisdictional boundary for COE and not strictly based upon the river's hydrograph. According to the Parson's Brinkerhoff hydrodynamic study done for the sediment cap design, at the McCormick and Baxter site OHW is equal to the 20-year flood elevation.

Pg. 16, Subsurface Barrier Wall, last paragraph: *Although the barrier wall segment located downgradient of the FWDA does not key into a continuous, competent aquitard, this segment of the wall was extended to such a depth that DNAPL migration ~~toward~~ the river will be substantially retarded because of the increased length of the flowpath.* We suggest the preceding change to support/explain the reasoning put forth here. DNAPL flux under the wall and through the hole may actually increase because of the changed hydraulics, but release to the river will be reduced because more of the NAPL will be captured in the pore-spaces of the longer migration pathway.

Section IV, Operation and Maintenance: This section needs to identify operation and maintenance contingencies for the riparian area. It is not described under either the soil cap or the sediment cap. A reader looking only at this section might be misled into believing that there no contingencies exist for monitoring and maintenance of this area.

Section IV, Operation and Maintenance, Sediment Remedy: This describes monitoring and maintenance for the "deeper areas" but does not indicate any monitoring or maintenance of areas too shallow for vessel-based sonar surveys. As noted in the site meeting of August 7, 2006, it is recommended that a photo survey of the shallow water areas and riparian area be conducted in the late summer or early fall, when river levels are a minimum, to enable reviewers to determine whether these areas are in need of maintenance or redesign.

Pg. 20, Engineering and Institutional Controls, 2nd paragraph: *Access to monitoring wells is controlled by the security fencing and gates.* Some of the monitoring wells are outside of the security fence, including all of the wells just outside of the barrier wall, in the riparian area. In addition, some of the wells for gauging groundwater elevations and developing groundwater contours are located off the property. The wells that produce the

greatest volume of DNAPL are also outside the security fence. How are these wells protected from vehicles and vandals? Are they protected? The locations and identifiers for all the monitoring wells should be provided on an additional Figure.

Pg. 21, Sediment Remedy: The Draft O&M Plan indicates the sediment cap has an area of 23 acres, not the 25 acres noted here. Please clarify the correct acreage.

Pg. 21, Sediment Remedy, last sentence: *Additional monitoring is needed to determine the effectiveness of the sediment cap, especially during late summer, when low river conditions ~~when~~ produce hydraulic forces that favor NAPL migration and dissolved-phase chemical transport.* Please add: The higher temperatures of late summer also reduce the viscosity and density of creosote, increase the solubility of organic contaminants, and favor the microbial activity that results in gases bubbling, which may carry NAPL to the surface.

Pg. 23, Lack of Post-Construction Performance Data: At a minimum, this should list the available data sets, including the monthly reports on groundwater monitoring since construction of the barrier wall, and the September 2005 and May 2006 datasets. (See brief analysis in General Comments section of this correspondence.) In our view, one set of post-remedy data for spring (high river) conditions and one for fall (low river) conditions are insufficient for purposes of establishing the long-term effectiveness of the remedy. Hence the conclusion that it is too early to make a decision is still valid.

Table 2, Issues: The section that combines “erosion of sediment cap” with “release of NAPL sheens” suggests cause and effect. These two issues should be separated because the cap’s purpose is not just to prevent the release of NAPL, but also to prevent the exposure of aquatic biota to the contaminated sediment that remains beneath the armored cap. If the cap is damaged, its repair is necessary even in the absence of a NAPL sheen/release. Furthermore, NAPL sheen/releases have been observed even in the absence of cap erosion. These are two independent issues. One response to the NAPL sheens is to collect and review data from the wells immediately down-gradient of the barrier wall. (Recall that the project teams’ assessment that NAPL has not migrated through a break in the barrier wall is based primarily on data collected from these wells and measured groundwater elevations and interpreted contours.)

Additional Comment: Who owns or controls the riparian area? What assurances are there that this area will be maintained as habitat and not become a transportation corridor, or boat landing?

Editorial suggestions for the O&M Plan:

Pg. 4, 2nd paragraph, line 3:

construction of a 25-foot by 40-foot shop building ~~shop building~~; and reinstallation of

Pg. 4, Sec. 4.A. Soil Operable Unit Remedy, bullet 5:

- 12,000 cubic yards of 4"-minus crushed rock forming a ~~screened~~ biotic barrier layer approximately 6 inches thick

The crushed rock may be screened, but it is our understanding that the biotic barrier is not screened.

Pg. 4, Sec. 4.A. Soil Operable Unit Remedy, bullet 8: 20 species of native grasses to provide a diverse and sustainable ~~herbaceous~~ herbaceous cover in order to minimize surface erosion

Pg.5, Sec. 4.A. Soil Operable Unit Remedy, 2nd complete paragraph, line 4: The surface of the soil cap is graded at ~~to a~~ one percent slope in order to direct

Pg.5, Sec. 4.A. Soil Operable Unit Remedy, 2nd complete paragraph, last sentence: The purpose of this vegetation ~~along with~~ and the native grasses is to ~~help~~ stabilize the soil against stormwater erosion and to reduce rainwater ~~percolation into groundwater infiltration~~ by increasing evapotranspiration.

Pg.6, Sec. 4.B. Sediment Operable Unit Remedy, 2nd complete paragraph, line 6: The cap consists of a 2-foot thick layer of sand ~~layer~~ over most of the

Pg.7, Sec. 4.B. Sediment Operable Unit Remedy, 5th complete paragraph, lines 6-8: The purpose of this vegetation ~~along with~~ and the native grasses is to ~~help~~ stabilize the soil against stormwater erosion and to reduce rainwater ~~percolation into groundwater infiltration~~ by increasing evapotranspiration.

Pg. 8, Sec. 4.C. Groundwater Operable Unit Remedy, 1st bullet, line 3: system and treated by a dissolved air flotation (DAF) system.

Pg. 14, Sec. 7A, Summary of Remedial Action Objectives and O&M Performance Standards: Maintain contaminant concentrations in surface sediments below the following cleanup goals, as specified in the ROD:

.....

Dioxins/furans – 0.000008 mg/kg, dry weight¹

The number as written is 8E-6, but the footnote indicates the correct value is 8E-5.

Pg. 20, Number 14, Safety Requirements For O&M Activities: The ~~health~~ health and safety plan will cover those activities potentially resulting in exposure to hazardous substances.

¹ The sediment cleanup goal for dioxins and furans provided in the ROD (8×10^{-3} mg/kg) is 1000 times higher (i.e., less stringent) than the cleanup goal established in the 1992 baseline risk assessment (8×10^{-5} mg/kg). The correct dioxin value of 8×10^{-5} mg/kg was used to establish the sediment cap boundary as documented in the *Sediment Cap Basis of Design* report (E&E 2002).

Pg. 20, Number 15, Description of Site Use, paragraph 1, line 4:

The perimeter of the property is posted with warning signs.

Pg. 21, Number 15, 1st complete paragraph, line 3:

NAPL recovery, the potential human health risks

Pg. 21, Number 15, 3rd complete paragraph, first sentence:

Termination of NAPL recovery will occur as previously discussed and ~~may~~ may result in the abandonment of unneeded site wells.

Pg. 21, Number 17, 1st paragraph, line 6:

Agreement (PPA) would specify the responsibilities of the purchasers for assuring

NOAA appreciates the opportunity to comment on these draft documents. If you have any questions about these comments, please contact me.

Sincerely,

Robert Neely
NOAA Coastal Resource Coordinator

cc: Alyce Fritz, NOAA / NOS / CPRD (by email)
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